The Predictive Validity of the Functional Capacities Evaluation

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This study tested the predictive validity of the Functional Capacities Evaluation (FCE), which included the following three components: a) a Medical History Review, b) a Client Activity Interview, and c) the Smith Physical Capacities Evaluation (SMITH-PCE) as the performance component. The FCE is used in conjunction with the Physical Demands and Environmental Conditions specified by the U.S. Department of Labor to predict a subject's ability to return to work. The study used a random sample of 52 subjects. An employment questionnaire served as a criterion measure of predictive validity.

The data from the questionnaires were compared with predictions from the evaluations, and a lambda test was applied to the data. Results suggested that for the sample analyzed, trained registered occupational therapists could use the FCE to predict a client's ability to return to work more accurately.

The study was limited in that the sample used was drawn from clients seen in only one private practice and that only 42% of the questionnaires were returned.

During the past decade, there has been increasing interest in the professional expertise of occupational therapists to assess functional capacities. Occupational therapists possess credentials that make them experts and expert witnesses in their field. This is of particular interest to attorneys establishing the extent of functional loss suffered by individuals as a result of illness or injury. By documenting an individual's loss (or lack of loss), these experts do the following:

• assist insurance companies in settling claims for personal injury,
• assist judges and juries in awarding amicable damages in personal injury litigation, and
• assist administrative boards in determining whether a person who is ill or injured meets a governmental agency's particular criteria of eligibility to be awarded benefits based on his or her claim.

The profession's long tradition of providing prevocational assessments and its involvement in diverse phases of rehabilitation (psychosocial and physical restoration as well as prevocational evaluation and treatment) make the occupational therapist a vocational expert (Occupational Therapists, 1981) in the broad sense. Moreover, the occupational therapist can often provide appropriate referrals for rehabilitation services, which can help the individual become more capable of activity ranging from improved self-care functioning to job-oriented activities. One test used by occupational therapists for these purposes is the Functional Capacities Evaluation (FCE), which is used with the Smith Physical Capacities Evaluation (SMITH–PCE) as the performance component (Baxter, 1978; Kester, 1979; Smith, Cunningham, & Weinberg, 1983).

We conducted this study to test whether registered occupational therapists (OTRs) can reliably administer and interpret the FCE, which includes the SMITH–PCE, to accurately predict the disabled worker's capacity to return to work. Our predictions were based on the results obtained through the FCE. This study did not focus on the traditional vocational assessment to predict employability. Nor did it focus on the FCE's usefulness as a work readiness assessment for making recommendations for work hardening and/or a vocational evaluation. Instead it focused on a newly developing area of practice, that of forensic occupational therapy (Smith, 1984). The specific concern of this testing is to determine the client's potential to return to employment following permanent impairments resulting from illness or injury. Specifically, our study attempted to predict if the clients would be able to meet the physical demands and tolerate the environmental conditions of their former occupation, an occupation for which they had transferable skills, or another occupation, which
would require additional education and/or training. This study did not assess the particular vocational skills and knowledge that the client possessed or had the potential to develop, rather it examined the validity of the SMITH-PCE as a performance component of the FCE.

**Purpose**

Occupational therapists began to develop and use physical capacities evaluations in the late 1940s and early 1950s to assess the patient's capacity to meet the physical demands of work as part of prevocational assessments. The evaluations were developed to comply with the industrial and vocational rehabilitation legislation of the time. Although these instruments have been in use for many years, they largely remained screening assessments. There is no literature documenting research on establishing instrument validation or examiner reliability (Smith, 1964). As the pendulum swings back to a more holistic approach to health care, a renewed interest in returning the ill and injured to work has emerged. Developing more sophisticated evaluation instruments has become necessary to document objectivity and accountability. In recent years, functional evaluations, including work capacity evaluations, have been developed with er-

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**Figure 1**

**Physical Capacities Evaluation Questionnaire**

1. Are you married now? _yes_ _no_ 
   If no, are you: widowed _ divorced _ never married _ separated _

2. Has there been a change in your family or living situation (for example, if you have moved, or if your husband or wife has lost their job, or if family member has moved out of the house, etc.) since your Evaluation? _yes_ _no_ 
   If yes, what kind of change? ______

3. Are you receiving any medical or surgical help these days? _yes_ _no_ 
   If yes, what kind of help? ______

4. Have you received any other medical or surgical help since your Evaluation? _yes_ _no_ 
   If yes, what kind of help? ______

5. Are you receiving any rehabilitation services these days? _yes_ _no_ 
   If yes, what kind of program? ______

6. Have you received any other rehabilitation services since your Evaluation? _yes_ _no_ 
   If yes, what kind of services? ______

7. Are you in an educational or vocational training program these days? _yes_ _no_ 
   If yes, what kind of program? ______

8. Have you received any other educational or vocational training since your Evaluation? _yes_ _no_ 
   If yes, what kind of program? ______

9. Are you now employed? _yes_ _no_ 
   If no, what is the reason? ______

10. Have you been employed anywhere else since your Evaluation? _yes_ _no_ 
    If yes, what was your job? ______ How long did you have this job? ______

Please list all of the jobs you have had and the schools you have attended since your Evaluation:

<table>
<thead>
<tr>
<th>Job Title(s) or School Name(s)</th>
<th>From (Month/Year) To (Month/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>
gonomic standards and examiner reliability being applied in interpreting the results (Matheson, 1984; Blankenship, 1984; Back disability, 1984). This study was undertaken in response to today’s requirements for quality assurance, objective documentation, and accurate predicting of residual work capacity between specialty professions (i.e., occupational therapy, physical therapy, and psychology). Our purpose was a) to show the unique contribution that the occupational therapist is able to make as a forensic expert in predicting a client’s capacity to return to employment and b) to validate the SMITH-PCE as the performance component of the FCE. Because occupational therapists frequently use the FCE with the Smith-PCE as the performance component in a variety of practice settings, there is a need to establish its predictive validity.

**Method**

The FCE has three components. The Medical History Review summarizes the client’s pertinent medical and psychological records. It gives the therapist an understanding of the pathology, the medical contraindications for activity, the prognosis, and recommendations for further medical, psychological, and/or surgical intervention.

The Client Activity Interview obtains the client’s work history, educational background, family and home responsibilities, leisure interests, and ability to perform personal care. Its purpose is to gain an understanding of the client’s skills, knowledge, interests, and past and present activity levels.

The SMITH-PCE, the performance component of the FCE, identifies the client’s current status in being able to use their body as a whole to meet the 20 physical demands of work identified by the U.S. Department of Labor (1977, 1981). This component permits the therapist to weigh the clients’ assets against their deficits to arrive at a total assessment of their functional capacities. The SMITH-PCE is used only if a client’s problem affects his or her entire body (e.g., the back, knee, neck, and other central parts of the body). Therefore, all subjects in this study sample had problems affecting their whole body functioning.

The Physical Demands and Environmental Conditions specified by the U.S. Department of Labor (1981) are used as a cross-reference in determining the primary physical demands and environmental conditions of a specific job. These are cross-referenced to the physical demands and environmental conditions that the client specifies as being required in his or her job. Other factors such as intellectual deficits, behavioral deviations, or a limited education may also influence a disabled worker’s ability to return to employment. Information relative to these additional factors is gathered from the Medical History Review and the Client Activity Interview components of the FCE. Information obtained from all components is interpreted before the final prediction for the FCE is made.

The study sample consisted of all 125 clients who had been evaluated with the FCE over a 5-year period (1975–1980) in a private occupational therapy practice. All FCEs included the components identified above.

Three attempts were made to collect information from the 125 subjects. First, the Physical Capacities Evaluation Questionnaire (see Figure 1) was mailed with a cover letter to the address given at the time of the evaluation. When questionnaires were returned as nondeliverable, the referring source was contacted and asked for a current address and phone number. When questionnaires were not returned, a second letter and questionnaire were mailed. When there was no response to the second mailings, we made an attempt to contact the subjects by phone. However, many telephone numbers were not current, and some subjects did not have a telephone. Therefore, the first study sample consisted of 52 subjects with completed questionnaires. The FCE’s prediction of return or nonreturn to work was compared with the actual return or nonreturn status identified on the questionnaire.

**Analyses and Results**

Table 1 shows the age, race, and sex of the 52 subjects. The sample included more whites than blacks, and more males than females. Only one of the four age categories (40–49 years) used in Table 1 included one black female. Roughly the same number of clients were 40 years or younger as were 40 years or older.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>White Male</th>
<th>White Female</th>
<th>Black Male</th>
<th>Black Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–29</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>30–39</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>40–49</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>&gt;=50</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>12</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1 shows that out of the 52 evaluations analyzed 45 had correct predictions. The value of lambda for this data set is .50, which means that the use of the FCE to predict outcome decreased prediction errors by 50%.

**Discussion**

An analysis of the data shows that for the sample studied the FCE can be used to predict a client’s ability to return to work with increased accuracy. This suggests that the FCE has predictive validity. However, the results only demonstrated such validity for occupational therapists specifically trained in administering and interpreting the evaluation.

A limitation to our findings arises from the fact...
Table 2  
Predicted and Observed Returns to Work

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Observed Return</th>
<th>Observed No Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>No Return</td>
<td>4</td>
<td>35</td>
</tr>
</tbody>
</table>

Note: Lambda_0 = 0.50.

that 73 of the 125 questionnaires (58%) were not returned. If those nonreturns constituted a special subset of our population, their absence may have biased our results.

We also failed to show any effects of age, race, or sex on the ability to predict outcomes because our sample was too small to draw any conclusions about such effects. For example, since the sample contained only one black female, our evaluation may not be valid for black females. An examination of a larger number of clients would resolve this problem.

In addition, the large number of subjects in this sample who did not return to work (73%) limited the power of lambda_0 to evaluate the instrument's predictive strength. If therapists had predicted that no subject in this sample would return to work, only 27% of the predictions would have been incorrect. Using the FCE to predict outcome decreased the error rate to 13%, or approximately 50% of the original 27%. This directly relates to the value of .50 for lambda_0. A different sample, with approximately the same number of subjects returning to work and not returning to work would have given a more powerful analysis of the FCE's predictive ability.

Furthermore, all subjects came from southern Louisiana. This lack of geographic randomness may have limited us to certain cultural backgrounds. An adult white male from the Midwest may have a stronger or weaker work ethic than his counterpart from southern Louisiana. Further analyses with clients from different geographic and cultural environments would permit an investigation of the influence of geography and culture on the validity of the functional evaluation.

Moreover, although we tested validity, we did not examine the FCE's reliability. Comparing duplicate evaluations made by the same therapists of the same client could estimate the evaluations' intrarater reliability.

In addition, the senior author trained all occupational therapists in the study to administer and interpret the FCE. Thus we have only demonstrated that occupational therapists with this special training can produce valid results. The question remains whether occupational therapists without this special training can produce valid results. Even the latter therapists fulfill certain educational prerequisites for administering the FCE. Particularly relevant would be their educational background, which is unique in its combination of subjects that include normal human growth and development, anatomy, kinesiology, psychiatry, medical conditions, and activity analysis. Future research could compare occupational therapists with and without special training to determine whether special training is necessary for the FCE's validity.

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References


